ANATOMY OF THE 2011 SEVERE STORM EVENT AND LESSONS LEARNED

Presentation to the
SCIENCE, TECHNOLOGY & TELECOMMUNICATIONS COMMITTEE

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TODAY'S AGENDA

- **REVIEW THE TIMELINE OF THE FEB 2011 SEVERE WEATHER EVENT**
- **DISCUSS LESSONS LEARNED AND PROVIDE UPDATE**

COMMISSION INITIATIVES

IN RESPONSE TO THE NATURAL GAS CURTAILMENT CRISIS, THE NEW MEXICO COMMISSION INITIATED TWO ACTIONS:

1. Undertook a formal investigation in docketed Case No. 11-00039-UT to examine New Mexico Gas Company's actions before, during and after the severe storm. The scope of the case included:

    a. a review the regional gas supply picture;
    b. an examination of what NMGC did to prepare for the severe weather;
    c. an examination of NMGC 's handling of the curtailments and the relighting efforts; and
    d. an examination of NMGC's post-mortem review

The docket was closed on 12/13/2012. The Commission found that NMGC acted reasonably in anticipation of the severe cold, and acted in accordance with applicable rules and regulations during and after the system emergencies.

COMMISSION INITIATIVES (Cont'd):

2. Created a separate, informal task force consisting of Staff, electric utilities, gas utilities, the Attorney General's office, production and pipeline companies, other state and federal government agencies, and consumer representatives, to:

    a. review the reasons behind the gas supply failure,
    b. review the condition of NM's natural gas and electric infrastructures, their inter-dependence, and their susceptibility to failure in severe cold events, and
    c. recommend actions to mitigate future problems in such an event.

The Task Force published the "Severe Weather Event of February, 2011 and Its Cascading Impacts on NM Utility Service" on 12/21/2011.

Because the severe weather was a regional event, the FERC, NERC, and Texas state regulatory bodies also conducted investigations and follow-on reports.

The CASCADING Events …

- Over the last couple of decades, electricity production in Texas, New Mexico, and the Southwest has become increasingly dependent on natural gas as fuel for generation, in response to air quality concerns with using dirtier fuels …

- Similarly, natural gas processing plants and pipeline compressors have converted to electricity, in response to increasing air quality restrictions with burning treated and untreated natural gas …

- At the well heads and the processing stations, “flaring” has become a dying practice…

- And remember, our gas in New Mexico comes from the southern basins; almost none comes from the cold weather hardened northern basins …

The CASCADING Events …

- In early February 2011 a wet, unusually cold arctic storm starts to move over Oklahoma and Texas from the north and east. As a result,
  - electricity and gas demand in Oklahoma and Texas jump
  - electric generating plants in NW Texas shut-down or curtail (wet coal piles freeze, steam in pipes condenses and freezes, lubricating oil doesn't want to flow, sun doesn't shine and wind doesn't blow, etc.)
  - gas wells freeze up and production starts to shut down
  - Rolling electric brown-outs start; electric-driven gas compressors can't run and gas processing plants aren't able to process the reduced amount of gas that is able to flow
- Gas supply to interstate pipelines diminished

The CASCADING Events …

- In New Mexico, as the storm, now relatively dry (fortunately), moves in …
  - Electricity and gas demand also jump
  - Some electric generating plants freeze, shut-down or have trouble staying stable and on-line, mostly in the southern NM
  - Gas production in San Juan and Permian basins freeze up
  - Already low, pressures in the interstate pipelines drop even more
- As a result, gas cut off to northern NM communities; people rely more heavily on electricity for human needs, like cooking and heat

ISSUES

- Power plant weatherization
- Electricity increasingly reliant on NG; more demand-side generation on single supply
- Lack of back-up fuel at power plants
- NG processing plants unable to flare
- Compressors increasingly reliant on electricity
- Lack of local NG storage
- Tight electrical transmission systems and pipeline systems
- Communications between utilities and customers

Report Recommendations to the NMPRC:

Recommendation NMPRC1:

The Commission should consider implementing a central location on its internet site where utility customers can obtain information on interruptions or curtailments. The Commission should strive for information to be up-to-date and real time. Status: Under consideration.

Recommendation NMPRC2:

The Commission should consider implementing a central location on its internet site where utility customers can obtain information on how and where to report outages and other emergencies and where Commission staff can obtain information on utility contacts regarding normal information, outages and emergencies at their various locations, during both business and non-business hours., Status: Instituted 24-hours call in and on-line utility outage reporting system.

Recommendation NMPRC3:

The Commission should consider modifying its rules to more explicitly require regulated electric and natural gas utilities to consider fuel diversity, alternative or redundant fuel delivery systems, and back-up fuel capability in their planning processes. Status: Rules changed to include requirements.

Recommendation NMPRC4:

The Commission should consider modifying its rules to require utilities to: 1) recognize natural gas-dependent generating facilities that directly or indirectly serve retail load as critical load; and, 2) require utilities to recognize electricity-dependent natural gas storage and transportation or distribution facilities that directly or indirectly serve retail load as critical load. See also Recommendation NMPRC6. Status: Rules changed to include requirements.

Recommendation NMPRC5:

The Commission should modify rule 17.9.560.15 NMAC dealing with reporting of electric system outages to the Commission to incorporate a reporting requirement that was instituted by letter in late 2005, but that is not contained in the rule when last revised in 1988. To the extent possible, outage reporting requirements for both electric utilities and natural gas utilities should be consistent. Modification of rule 17.9.660 NMAC may be required to accomplish this. Status: Rules changed to incorporate requirements; 24-hr and on-line outage reporting instituted.

Recommendation NMPRC6:

For regulated natural gas and electric utility emergency plans, the Commission should consider requiring such plans to include:

- **a process whereby the utilities identify "escalating" levels of emergency response that may be needed;**
- **a method to contemporaneously document the occurrences and the action contemplated for each level; and**
- **a plan for contemporaneous communication at each emergency level of the potential impacts or actions with potentially affected customers, government agencies and emergency response entities, and the public. Status: Rules changed to incorporate requirements. Utilities have modified procedures.**

Staff's Draft Report Recommendations to Others:

Recommendation O1:

Properly marked utility service response vehicles should be afforded access privileges in emergencies, consistent with safety considerations, when public road access is otherwise curtailed to the general public.

Recommendation O2:

Electric generating facilities that utilize natural gas as the primary fuel should be allowed to utilize a back-up fuel (such as diesel fuel) during system emergencies.

Recommendation O3:

To reduce fuel interdependencies, natural gas processing plants, pipeline and natural gas storage facilities should utilize natural gas as the primary fuel for driving equipment whenever possible. Permitting processes should encourage the use of natural gas for these applications whenever possible.

Recommendation O4:

Consider allowing natural gas processing plants to bypass (by flaring or other means) natural gas during plant downtime during system emergencies, to avoid production shutdown.

Recommendation O5:

New Mexico should consider: 1) creating an inventory of potential natural gas storage locations in New Mexico and 2) various means of encouraging development of identified viable locations including incentives and fast-track approval methods.

Recommendation O6:

Local, state, and federal governments should encourage winterization and redundancy in critical electrical system and natural gas supply chain components. Methods such as tax incentives, streamlining approval processes, or other innovations could be employed.

Recommendation O7:

As a precaution and because of greater reliance on publicly-available systems such as mobile telephones, all critical services (including electric utility, natural gas utility, water utility, wastewater utility, telecommunications utility, and other critical services) should review their physical communications systems for weaknesses or possible failure points. The Task Force did not examine this topic since there was no telecommunications system failure reported during the February 2011 event.

Recommendation O8:

Given the complexity and interdependence of the natural gas supply chain and the electrical system, a permanent structure, possibly a committee or task force, should be established at the state level to review system failures of the nature experienced in February 2011.

Actions by federal agencies or by utilities:

- NERC has expanded pre-winter preparation procedures with severe cold weather response emphasized (heat tracer lines, additional insulation, wind breaks, etc.) (electric)

- FERC has required installation of heating system for electric SF6 transmission equipment (electric)

- NERC has expanded emergency communication process (electric)

- FCC has required back-up power at critical communication sites (towers, switch stations, etc) (communications)

- FERC is reviewing gas nominations and priority of service systems (natural gas)